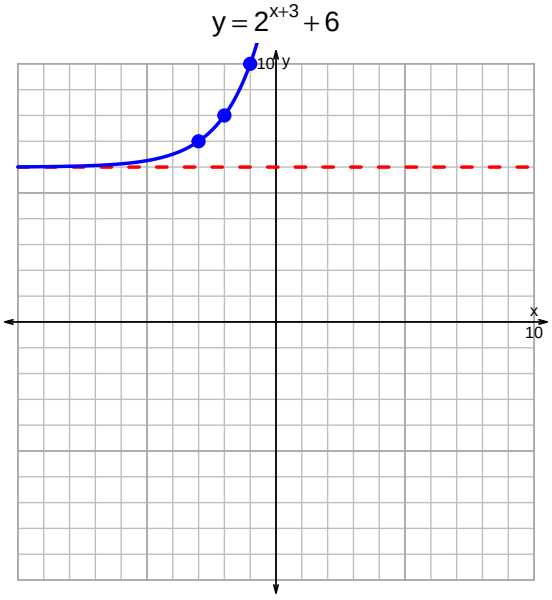
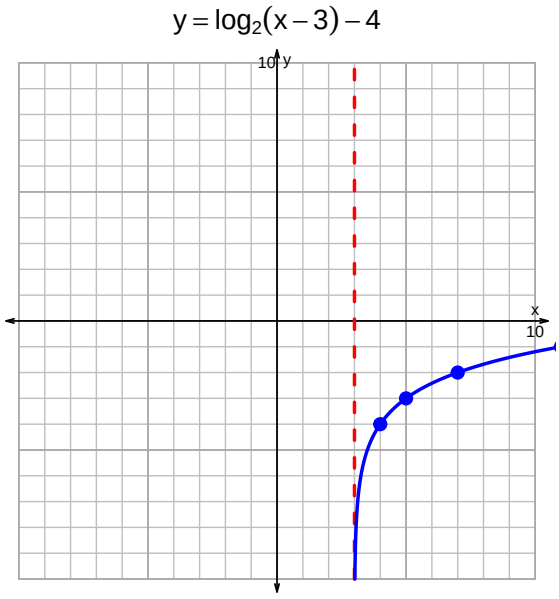
Name: Date:

S18QUIZ: EXP LOG (SLTN v291)

1. Graph $y = 2^{x+3} + 6$ and $y = \log_2(x-3) - 4$ on the grids below. Also, draw any asymptotes with dotted lines.





2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-19 = \left(\frac{-5}{3}\right) \cdot 2^{-7t/4}$$

Divide both sides by $\frac{-5}{3}$.

$$\frac{19 \cdot 3}{5} = 2^{-7t/4}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{19 \cdot 3}{5}\right) = \frac{-7t}{4}$$

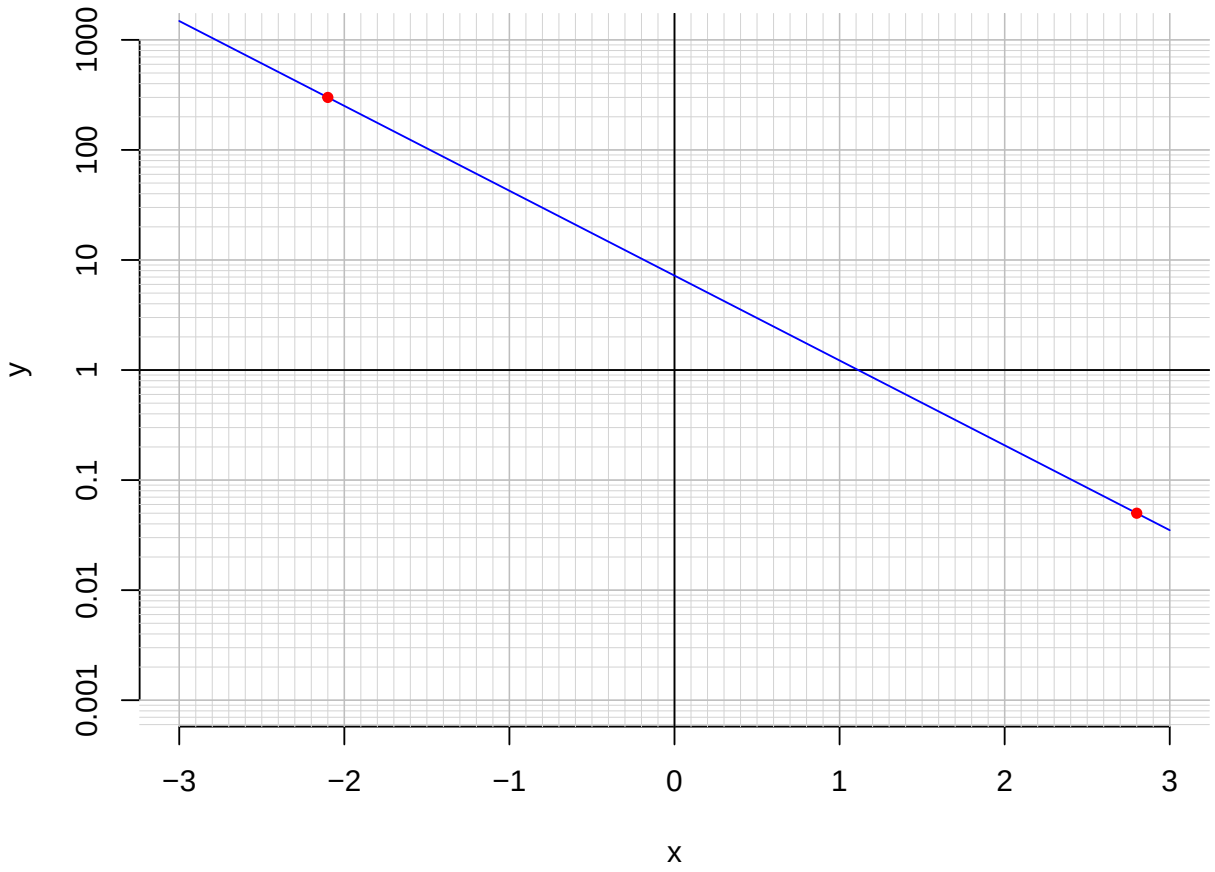
Divide both sides by $\frac{-7}{4}$.

$$\frac{-4}{7} \cdot \log_2\left(\frac{19 \cdot 3}{5}\right) = t$$

Switch sides.

$$t = \frac{-4}{7} \cdot \log_2\left(\frac{19 \cdot 3}{5}\right)$$

3. An exponential function $f(x) = 7.21 \cdot e^{-1.78x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.1)$.

$$f(-2.1) = 300$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{1.78} \cdot \ln\left(\frac{x}{7.21}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.05)$.

$$f^{-1}(0.05) = 2.8$$